Development of National Digital Library of India

Towards Building a National Asset

NDL: VISION & MISSION

NATIONAL IDR WORKSHOP
Central Library, IIT Kharagpur

NMEICT: National Mission on Education Through Information And Communication Technology

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BUILD UP NATIONAL DIGITAL LIBRARY (NDL) AS A NATIONAL KNOWLEDGE ASSET – THE KEY DRIVING FORCE FOR EDUCATION, RESEARCH, INNOVATION, AND KNOWLEDGE ECONOMY IN INDIA
TO CREATE A 24X7-ENABLED INTEGRATED NDL AS A UBIQUITOUS DIGITAL KNOWLEDGE SOURCE OF THE NATION – CATERING TO IMMERSIVE E-LEARNING FOR ALL LEARNERS AT ALL LEVELS IN ALL AREAS

TO INITIATE A MOVEMENT FOR INTEGRATED DIGITAL LEARNING ACROSS INDIA
Introduction
Introduction

- National Digital Library
  - will be a national asset that is a key driving force for its education, research, innovation and knowledge economy
  - will cover the gaps that exist in the wide range from literacy to advanced knowledge discovery and development of knowledge
  - will enable integrated knowledge gathering on diverse topics on core issues from economic, strategic and social sectors
  - will help personalized, self-paced, new-age multi-media education at all levels
  - will ...
  - Not a new Library, but an umbrella over existing ones
Challenges faced by India in Education

- Wide geographic expanse & Large population
- Huge number of students – rapidly growing student base
  - Indian HE system is the largest in the world enrolling over 70 million students
- Large number of institutions
  - 1,24,500 secondary schools and over 11 Lakh elementary schools [Source: MHRD – NISG Report]
  - 659 Universities, 33,023 colleges and 11356 Stand Alone Institutions [Source: FICCI HE Summit 2012]
  - India needs to build 6 universities and 270 colleges every month in the next 20 years
- Varied linguistic diversity
- Severe lack of Teachers
- Lagging behind in digital initiatives
  - Lack of quality e-content in various digital forms and formats
  - Poor quality of connectivity due to lack of infrastructure
- ...

TEL with National Outreach
NMEICT Objectives

• “Catering to the learning needs of more than 50 crore Indians (working population) and of providing a one stop solution to all the requirements of the learning community”

• ...

• “Knowledge modules based on the personalized needs of the learner would need to be delivered to him / her at the right time with the right content interactively to take care of his / her aspirations”

Initiatives ...

- Generate Contents
- Create Repositories
- Develop Dissemination Channels
- Build Learning Platforms
  - MOOCs Model (Massive Open Online Courses)
- Set-up Infrastructure – NKN, Badal
- Integrate Stakeholders
- ...

IIT, Kharagpur
## Digital Library Initiatives...

### Samples

#### National
- INFLIBNET
- NPTEL, NMEICT
- NCERT
- Million Book Project (DL of India)
- NISCAIR
- IG Centre for the Arts
- National Mission on Libraries
- MUKTBODHA
- Traditional Knowledge DL
- Other Databases

#### International
- MIT Open Courseware
- Hathi Trust Digital Library
- Project Gutenberg
- Alexandria DL, California DL
- Networked DL of Thesis
- Library of Congress
- National Science DL
- Digital Public Library of America
- Electronic Library of UK
- DL Programme of Europe
- Others in Asia & Australia
In spite of so many initiatives, benefits are yet to reach the masses due to several reasons including:

- Repository Service Issues
- Integrated Learning Issues
Repository Issues

- Users have to visit individual websites to access e-resources. No single window search facility for accessing all available digital resources.
- Users need to learn retrieval techniques / search techniques separately as different Digital Library (DL) follows different DL software.
- User interfaces, often, are not interactive, collaborative and participative.
- Few mechanisms are available for differently abled learners.
- Absence of vernacular access & limited contents.
- Knowledge Repository on most subjects are not yet available for scholars.
Integrated Learning Issues

- Few e-Learning environments for the students and teachers that access information from all available sources
- Distance mode of learning in India is helping mainly to increase learner-base not the knowledge-base as effectively as needed
- Non-integration of learner-learner, teacher-teacher and teacher-learner communication tools within learning environment
- Learning resources are generally outside the integrated learning environment
Proposal
Approach NDL …

- ICT and e-contents @Schools, @Universities, @Colleges to help minimize knowledge gap
- Collaborative e-Learning Framework for all stakeholders to work together in the learning phase
- Facilitate & Empower Self-Based Learning Framework (SBLF) – the next most important learning phenomena
- Tablet & mobile devices to play a major role in SBLF
- New apps for accessing e-contents from NDL
- Entrepreneurs to participate to design and develop application software for providing value added services
NDL – Integrated Services to “The Nation & World Wide”

**Search Services**
- Classified Search
- Subject Based Search
- Multilingual Search
- Metadata Search
- Full Text Search
- Ranking of Search Results

**Community Service**
- Every reader his [or her] eBook/ Information
- S R Ranganathan 2nd Law of library science
- Research Scholars
- University Students
- College Students
- School Students
- Teachers
- Professionals
- General Users

**External Services**
- DDS (Document Delivery Service)
- Personalized services
- Union Catalogue

**Learning Services**
- Integration with E Learning Environment

**Plug & Play Apps**
- Apps for Differently abled users
- Mobile Apps
- Search Apps

**NDL Content Repository**

**Storage & Backup Replication**
Objective & Scope
Objectives

• Create a 24X7-enabled Infrastructure for NDL with single window search facility – To include h/w systems, networks, s/w tools, applications and interoperability standards

• Harvest IDRs (Institutional Digital Repository) across institutions of the nation to provide integrated access

• Facilitate select institutes to disseminate existing content and create new digital content

• Provide support for immersive E-learning environments at multiple levels spanning across
  o All academic levels – school to college to university to life-long learning
  o All disciplines – Science, Arts, Humanities, Engineering, Medical, Law, and
  o All languages (vernacular) used as medium of instruction.

• Support interfaces in vernacular & for differently abled users
Target Users

- School, College, and University Students
- Research Scholars
- Teachers
- Library Users
- Professional Users e.g., Legal Community Users
- Differently-Abled Users
- Life-long learners
Target Range of Contents

- PhD Thesis
- DSc Thesis
- M Tech Diss
- B Tech Diss
- Research Projects

- Faculty Publications
- Open Access Journals & E-Books & Subscribed E Resource

- Annual Reports
- Project Reports
- Convocations
- Working Papers
- Others

- Encyclopaedia
- Dictionaries
- Directories
- Others

- Class Notes
- Lecture Slides
- Laboratory Experiment Manuals

- IITs / NITs / Central University / Schools KVS, JNV etc

- Datasets, Software

- Audio & Video Content

- Books and Courseware of Schools / Colleges / Central Universities

- Question Banks, Model Answers

Contributing Institutes Institutional Digital Repository
The Big Picture

NATIONAL DIGITAL LIBRARY

MOOCs LMS

Virtual University and Certification
Methodology
How to NDL?

- How to get content?
- How to generate metadata?
- How to profile users?
- How to have MOOCs courses?
- How to get license?
- How to ...?
- How to ...?
- ...

- We hope to do it with help from you all ...
Host, Contributing & Participating Institutions

- Co-ordinating Host Institution NDL @IIT Kharagpur
- Contributing Institutes
  - Existing Contents of IDR Developed by various Institutions / DL Projects
  - Contents from Contributing Institute’s IDR
- Participating Institutes

Central Harvesting Server

Data Centre Server

Mirror Server
Host Institution

- IIT Kharagpur

Contributing & Participating Institutions

- INFLIBNET
- IITs / NITs
- IISc Bangalore
- IIMs / XLRI / Management Schools
- IISERs
- Central Universities
- Law School
- AIIMS / Medical Colleges
- Schools from KVS / NVS
- National Archives / Library
- Non-MHRD Institutions (Min of Law, Min of Culture, ISI, etc.)
- Private Schools, Colleges & Universities
With help from you all ... 

- Contributing Institutions
  - CIs setup IDRs
  - CIs regularly upload content
  - Host harvests and indexes content for NDL
- NMEICT Projects
  - Contributed to NDL
  - Crawled
- External Projects / Publishers / Voluntary Contributors
  - Crawled
  - Subscribed
- Participating Institutions
  - PIs use NDL and provide feedback
- Open Source / Free Domain Developers
  - Mobile Apps
  - Vernacular Support
Metadata Harvesting from various IDR

Higher Learning Institutions

- IDR @ IITs
- IDR @ NITs
- IDR @ CU
- IDR @ Law School
- IDR @ Medical Colleges
- IDR @ KVS
- IDR @ NVS

Navodaya Vidyalaya Samiti
Kendriya Vidyalaya Sangathan
Other School Boards

IDR @ DL Projects

Existing IDR
New Developed IDR

OAI-PMH Protocol
Dublin-Core
Metadata Format

Central Harvesting Server
@NDL IIT KGP

Community Access
- Research Scholars
- University Students
- College Students
- School Students
- Teachers
- Law & Medicine Professionals
- Life-long Learners
- General Users

Device Access
- PC
- Tablets
- Laptops
- Mobiles
- Etc

Content Delivery Server
@NDL IIT KGP

IIT, Kharagpur
15/6/2015
Methodology

- Identification of learning objects on global scale
- Selection of contributing and participating Institutes at various levels
- Detailing of Hardware Architecture
- Standardization of Metadata Envelop
- Development of a composite Software Architecture
  - Digital archive to Store learning objects
  - Learning Content Management System (LCMS) to provide teaching-learning-evaluation functionalities
  - Experience Tracking for Users
  - Search and retrieval layer with Indic-script-enabled user interface
Methodology

- Selection and creation of course contents for school and higher education students
- Selection of learning objects and incorporation of metadata
- Testing and debugging of NDL
- Participatory adoption across the nation
Open Issues

- Copyright Management
- License Management
- Crowd-Sourcing Promotion Policy
- Infrastructure Issues
- ... (audience to identify)
NDL PoC Demo
NDL Movement
NDL Office Inauguration, 21-Apr-15
INDEST Meeting @ Delhi, 28-Apr-15
Workshop @ INDEST Meet @ Mohali, 29/30-Apr-15
Library Committee Meeting, 21/22-May-15
National IDR Workshop
IIT Kharagpur
15~17-Jun-15
## Speakers

<table>
<thead>
<tr>
<th>Code</th>
<th>Name and Designation</th>
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<tbody>
<tr>
<td>BS</td>
<td>Dr. B. Sutradhar, Librarian, Central Library, IIT Kharagpur</td>
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<tr>
<td>PKB</td>
<td>Prof. Plaban Bhowmick, Dept of CET, IIT Kharagpur</td>
</tr>
<tr>
<td>PPD</td>
<td>Prof. P.P. Das, Dept of CSE, IIT Kharagpur &amp; Joint PI of NDL</td>
</tr>
<tr>
<td>PSM</td>
<td>Prof. Parthasarathi Mukhopadhyay, Dept. of LIS, U. of Kalyani</td>
</tr>
<tr>
<td>SB</td>
<td>Mr. Shibabroto Banerjee, Dept of CSE, IIT Kharagpur</td>
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<tr>
<td>SG</td>
<td>Mr. Sanjay Grover, M/s. Informatics Publishing Limited</td>
</tr>
<tr>
<td>SGR</td>
<td>Mr. Samrat Guha Roy, Central Library, IIT Kharagpur</td>
</tr>
<tr>
<td>SS</td>
<td>Prof. Sudeshna Sarkar, Dept of CSE, IIT Kharagpur</td>
</tr>
<tr>
<td>YS</td>
<td>Dr. Y. Singh, Librarian , IIT Roorkee</td>
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## Day 1 Schedule (15-Jun-15)

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>09:00 AM</td>
<td>Registration for Workshop Participants</td>
<td></td>
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<tr>
<td>10:00 AM</td>
<td>Inauguration</td>
<td></td>
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<tr>
<td>10:30 AM</td>
<td>NDL: Mission and Vision</td>
<td>PPD</td>
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<tr>
<td>11:30 AM</td>
<td>Tea</td>
<td></td>
</tr>
<tr>
<td>12:00 PM</td>
<td>Metadata Engineering &amp; Experience Tracking</td>
<td>PKB</td>
</tr>
<tr>
<td>01:30 PM</td>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>02:30 PM</td>
<td>Current Trends in LIS with reference to National Digital Library</td>
<td>YS</td>
</tr>
<tr>
<td>03:15 PM</td>
<td>Multi-Lingual Issues in IDR</td>
<td>SS</td>
</tr>
<tr>
<td>04:00 PM</td>
<td>Tea</td>
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</tr>
<tr>
<td>04:30 PM</td>
<td>J-Gate</td>
<td>SG</td>
</tr>
<tr>
<td>05:00 PM</td>
<td>Role of Contributing Institutions</td>
<td>BS</td>
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<tr>
<td>05:30 PM</td>
<td>Review of IDR Status &amp; Issues</td>
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## Day 2 Schedule (16-Jun-15)

<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speakers</th>
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</thead>
<tbody>
<tr>
<td>09:30 AM</td>
<td>Building Central Institutional Digital Repositories: Services, Issues &amp; Challenges</td>
<td>PSM</td>
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<tr>
<td>10:30 AM</td>
<td>Tea</td>
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<tr>
<td>11:00 AM</td>
<td>DSpace Installation and Configuration, User creation and Management, DSpace Access Authorization [DL]</td>
<td>SGR &amp; SB</td>
</tr>
<tr>
<td>01:30 PM</td>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>02:30 PM</td>
<td>Metadata registration &amp; Input Forms.xml, IDR Item Submit &amp; Workflow, Indexing &amp; Retrieval [DL]</td>
<td>SGR &amp; SB</td>
</tr>
<tr>
<td>08:00 PM</td>
<td>Dinner</td>
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<tr>
<td>Time</td>
<td>Topic</td>
<td>Speakers</td>
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</tr>
<tr>
<td>09:30 AM</td>
<td>DSpace UI Customizations, Configuration of OAI-PMH, Metadata Harvesting [DL]</td>
<td>SGR &amp; SB</td>
</tr>
<tr>
<td>11:00 AM</td>
<td>Tea</td>
<td></td>
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<tr>
<td>11:30 AM</td>
<td>IDR Disaster Recovery, IDR Backup and Restore [DL]</td>
<td>SGR</td>
</tr>
<tr>
<td>12:00 PM</td>
<td>Discussion for Follow-up Actions</td>
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<tr>
<td>01:00 PM</td>
<td>Valedictory and Certificate Distribution</td>
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</tr>
<tr>
<td>01:30 PM</td>
<td>Lunch</td>
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IDR Hands-on Outline

- **DSpace Installation & Configuration**
  - Participants will learn to DSpace database configurations, installation files and folders etc.

- **User Creation and Access Authorization**
  - Users access policy, Submitters access policy setting etc. will be delivered as hands-on

- **NDL Metadata Elements Registration**
  - Working with LRMI, IEEE-LOM, Dublin Core Metadata Elements

- **IDR Item Submit & Workflow**
  - The bit-stream upload process will be shown in this session

- **Data Indexing & Retrieval**
  - Various indexing commands and retrieval process will be demonstrated

- **DSpace UI Customizations**
  - Logo customizations, banner creation and creating a good look & feel for the user interface will be demonstrated

- **OAI-PMH Configurations & Metadata Harvesting**
  - Metadata harvesting using OAI-PMH protocol and various issues related to harvesting will be demonstrated.

- **IDR Disaster Recovery, Backup and Restore**
  - IDR backup and restoration is very much essential in case of any failure henceforth this session will demonstrate the disaster recovery ways and processes.
Forthcoming Events

- Regional (NE) IDR Workshop @ IIT, Guwahati, 4/5-Jul-15
- Regional (North) IDR Workshop @ IIT, Roorkee, Aug-15 (tentative)
NDL Mission

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Jai Hind!

Join

NDL Movement to

Make-in-India